The VacScene

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What's Inside?

Abbreviations: Public Health - Seattle & King County (PHSKC), Centers for Disease Control and Prevention (CDC), Advisory Committee on Immunization Practices (ACIP), Food and Drug Administration (FDA)

The VacScene

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The VacScene is a publication of Public Health – Seattle & King County written for health professionals. Content is consistent with the most current recommendations from the Centers for Disease Control and Prevention (CDC) and the Advisory Committee on Immunization Practices (ACIP).

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Breastfeeding: An Excellent Complement to Vaccination

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The American Academy of Pediatrics (AAP) recommends breastfeeding for the first year of life, and recognizes that breast milk is the *only* food infants need during the first six months.[1] Further, the AAP recommends breastfeeding be continued beyond the first year for as long as mutually desired by mother and child. Recent advances in scientific knowledge have revealed fascinating immunologic properties of breast milk. However, some parents may overestimate the ability of breast milk to prevent diseases in their infants. They may choose to defer or decline vaccinations, believing that the immune factors in breast milk may adequately protect their infants against vaccine-preventable diseases.

It is known that breastfed infants have lower rates of certain infectious and chronic diseases. The immune factors in milk and colostrum decrease the incidence and/or severity of a wide range of illnesses including: bacterial meningitis, bacteremia, prolonged diarrhea, infections of the urinary and respiratory tracts, otitis media, neonatal septicemia, and necrotizing enterocolitis. Breastfeeding is also associated with reduced infant mortality rates; lower incidence of sudden infant death syndrome (SIDS); and reduced incidence of diabetes mellitus (types 1 and 2), lymphoma, leukemia, Hodgkin's disease, overweight/obesity, hypercholesterolemia, and asthma.[1] Breastfeeding may also provide some protection against vaccine-preventable diseases such as invasive *Haemophilus influenzae* type b in infants less than six months, and pneumococcal disease among two to 11 month olds.[2]

Breastfeeding: Local Immune Protection on Mucosal Surfaces

All forms of antibodies or immunoglobulins (e.g., IgG, IgM, IgA, IgD and IgE) are found in human milk. The most prevalent form is secretory immunoglobulin A (sIgA) which resists digestion in the infant GI tract. Other bioactive agents in breast milk include interferon, oligosaccharides, lymphocytes (80 percent of which are T-cells), macrophages, lactoferrin, cytokines, and interleukins. These immune factors coat infant mucosal surfaces (e.g., the GI tract) producing a protective barrier against pathogens, and limiting entry to the systemic circulation. Most pathogens are initially introduced through the skin or mucous membranes and as a result breastfed infants have fewer enteric and respiratory infections. The immune factors in breast milk bind to toxins and virulent antigens, compete with microbes for attachment sites on infant tissue, and scavenge iron that pathogenic bacteria needs to survive.[3]

Active versus Passive Immunity

Immunization produces **active immune** responses allowing the infant *to make its own disease-specific antibodies to fight infections*. This protection usually lasts many years, and often for a lifetime. For example, it is known that three doses of inactivated polio vaccine is 99-100% effective in providing long-term immunity against polio.

The transfer of antibodies to the fetus through the placenta in utero and to the infant during breastfeeding are a type of **passive immune** protection. Most antibodies specific to vaccine-preventable diseases are transferred in utero, not through breastfeeding. The duration of these passively acquired serum antibodies is temporary and unpredictable (lasting from weeks to months). Disease-specific antibodies depend on the level of the mother's immunity to individual diseases, and are typically protective only for several months until they naturally degrade in the body.

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Maternal Antibodies: Serum Immunity

The fetus acquires serum antibody protection (IgG) through the placenta, predominantly during the third trimester. It is unreliable, however, to depend on maternal antibodies for protection against vaccine-preventable diseases because:

1. The mother may not have antibodies to all vaccine-preventable diseases.
2. Infant serum levels of maternal antibodies vary considerably, and it is unknown what level of antibody is protective.[4]
3. The duration of protection from infant maternal antibodies is unknown. Levels of maternal antibodies in infant circulation begin to decline in the first three months of life, and are minimal by four to six months of age.[4]
4. Protection conferred by maternal antibody against some diseases (e.g., polio, pertussis) is less effective than for other diseases (e.g., measles, rubella, tetanus).[5]

Inactivated vaccines are unaffected by passively acquired antibodies in infant circulation; however, live vaccines (e.g., MMR and varicella) are susceptible to attack by maternal antibodies reducing the vaccine's ability to stimulate adequate antibody production in the infant. To stimulate an effective vaccine immune response, live vaccines should be administered on or after the first birthday.

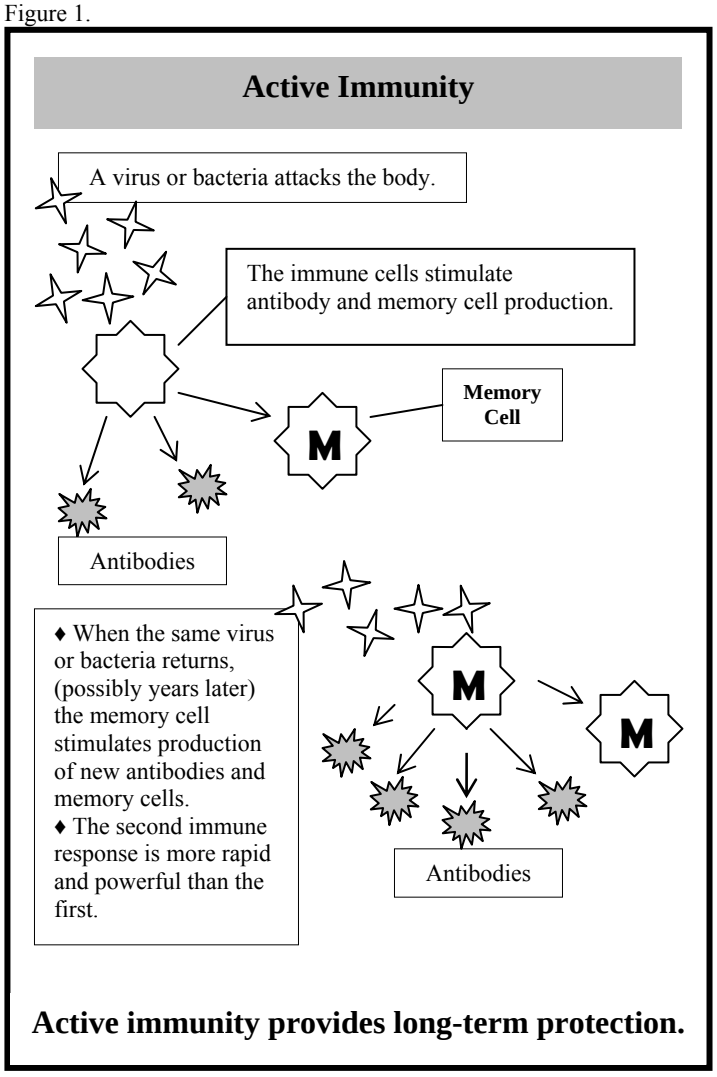
Breastfeeding: Not a Substitute for Vaccination

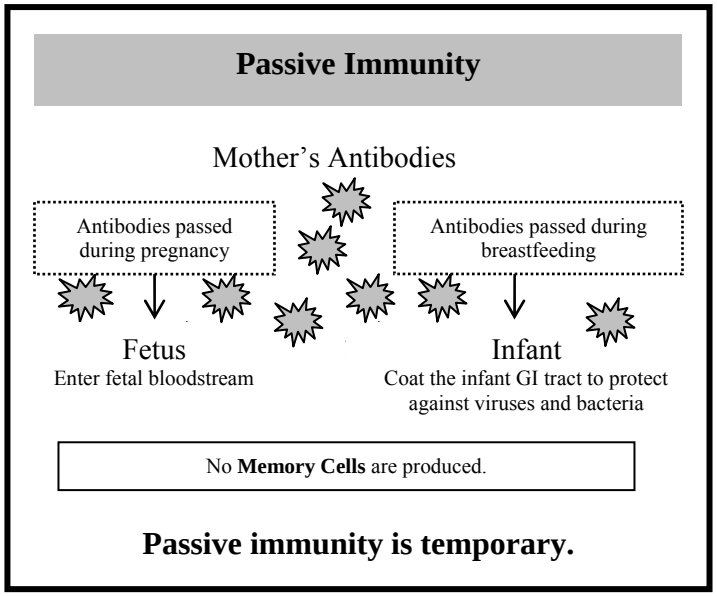
The benefits of breastfeeding in decreasing infections are significant, but not sufficient, and it is important for parents to realize that vaccinations provide additional protection beyond that provided by breastfeeding.

Breastfeeding is an excellent complement to vaccination. Parents may be interested to know about the analgesic properties of breast milk, and that it is safe to breastfeed before, during and after immunization. In addition, some studies have demonstrated that breastfeeding enhances the infant immune response to some vaccines (i.e., *Haemophilus influenzae* type b, tetanus and diphtheria).[6]

1. Gartner et al (2005). Breastfeeding and the use of human milk. *Pediatrics*, 115 (2): 496-506. (http://aapolicy.aappublications.org/cgi/content/full/pediatrics;115/2/496.)
2. Cochi et al (1986). Primary invasive Haemophilus influenza type b disease: A population-based assessment of risk factors. *J Pediatr*, 108 (6):887-96.
3. Goldman et al (1982). Immunologic factors in human milk during the first year of lactation. *J Pediatrics* 100:563.
4. Markowitz et al (1996). Changing levels of measles antibody titers in women and children in the United States: Impact on response to vaccination. Kaiser Permanente Measles Vaccine Trial Team. *Pediatrics,* 97(1);53-58.
5. Hanson LA (1998). Breastfeeding provides passive and likely long-lasting active immunity. *Annals of Allergy, Asthma, and Immunology*, 81(6), 523-537.
6. Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. Atkinson W., Hamborsky, J., eds. 8th ed. Washington DC: Public Health Foundation, 2004.

Figure 1.





Waiting Period After Vaccination?

Should patients be asked to wait after receiving vaccines to be monitored for immediate adverse reactions and syncope? In the past, the CDC had de-emphasized the waiting period recommendation. It was rationalized that good screening prior to vaccination will usually identify people who might have a problem afterward. Also, the checkout process may occupy patients an additional 10 to 15 minutes after vaccination, when a serious adverse reaction is most likely to occur.

The most current recommendation from ACIP (February 2002, General Recommendations, available at: www.cdc.gov/mmwr/preview/mmwrhtml/rr5102a1.htm) suggest a waiting period after vaccination. The following is an excerpt from the ACIP statement (page 14):

> ***"****Syncope (vasovagal or vasodepressor reaction) can occur after vaccination, most commonly among adolescents and young adults.* ***During 1990–August 2001, a total of 2,269 reports to the Vaccine Adverse Event Reporting system were coded as syncope. Forty percent of these episodes were reported among persons aged 10–18 years*** *(CDC, unpublished data, 2001). Approximately 12% of reported syncopal episodes resulted in hospitalization because of injury or medical evaluation. Serious injury, including skull fractures and cerebral bleeding, have been reported to result from syncopal episodes after vaccination. A published review of syncope after vaccination reported that* ***63% of syncopal episodes occurred less than 5 minutes after vaccination,*** *and 89% occurred within 15 minutes after vaccination****.*** *Although syncopal episodes are uncommon and serious allergic reactions are rare,* ***certain vaccination specialists recommend that persons be observed for 15–20 minutes after being vaccinated,*** *if possible. If syncope develops, patients should be observed until the symptoms resolve."*

Screening for Susceptibility to Syncope

♦ Observe for presyncopal signs and symptoms: **hypotension, bradycardia, anxiety, pallor, perspiration, trembling, or cool, clammy skin.**

♦ Take precautions with asymptomatic patients who report a history of syncope or presyncope symptoms.

♦ Advise at-risk patients to lie down before receiving vaccines to avoid injury if syncope occurs.

King County VFC News

-Vaccines For Children Program-

New Provider Agreement Requirement

Please note the 2006 Provider Agreement for Receipt of State Supplied Vaccine contains a new requirement. Provider organizations receiving more than $500,000 in federal funding (includes staff, "in kind" value of VFC vaccines, and any other federal grant funded items) must provide a copy of their A-133 Circular Audit to Public Health along with their signed Provider Agreement. Please see the Provider Agreement for more details.

Receiving Varicella Vaccine

Public Health staff have again documented a series of unfortunate incidents where varicella vaccine shipments were not placed in the freezer upon delivery, and the vaccine spoiled at room temperature. Varicella vaccine deliveries come direct to providers from the manufacturer and their delivery date cannot always be anticipated. Please be sure that all employees, including reception staff, are aware of the importance of **visually checking all deliveries** to assure that packages containing vaccine are not overlooked, and are stored appropriately.

New *"Pink Books"*

The Centers for Disease Control & Prevention is publishing the new (9th Edition) "Epidemiology and Prevention of Vaccine Preventable Diseases," also known as the Pink Book. We will send a copy of this useful vaccine-preventable disease resource to each participating VFC clinic upon receipt of the signed, completed 2006 Provider Agreements. The Pink Book will be addressed to the attention of the VFC Program contact at each office/clinic/practice listed in the agreement.

Frequency of Vaccines Ordering from the VFC Program

One VFC Program priority is assuring that health care providers have enough vaccine to meet patient needs. A competing priority is keeping down our shipping costs, which range from $8,000 to $12,000 per month. The less we spend on shipping, the more money there is to buy vaccines. Whenever possible, limit your vaccine requests to once every 30 days. We can gladly provide emergency shipments when demand is higher than expected, but these should be exceptions. Call us at (206) 296-4774 if you would like a report showing your clinic's previous 12 months of vaccine usage, which can provide ordering guidance.

Hepatitis A Vaccine

Hepatitis A vaccine is now recommended by ACIP for **all children from one to 18 years**. Previously the vaccine was recommended for children $\geq$ 2 years residing in high-risk areas based on local disease incidence (including Washington State). CDC has not finalized the ACIP recommendation yet (but is expected to do so) and at this time, Washington State's VFC does not provide hepatitis A vaccine for children less than two years of age.

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2006 Epidemiology and Vaccine-Preventable Disease CDC Satellite Course

The CDC's live four-part satellite broadcast, ***"Epidemiology and Prevention of Vaccine-Preventable Diseases***" has begun **(February 9, 16, 23** and **March 2, 2006)**. The course is co-sponsored by the Region X Public Health Service and will be held in Seattle at the Blanchard Plaza Building (6th and Blanchard). Each interactive broadcast will run from 9:00 a.m.-12:30 p.m. To attend, call (206) 296-5252 or view the broadcast online by accessing: www.phppo.cdc.gov/PHTN/webcast/epv06/default.asp.

The 2006 Recommended Childhood and Adolescent Immunization Schedule is Now Available!

Here is a brief summary of changes in the new schedule:

1) The importance of the hepatitis B vaccine (HepB) birth dose has been emphasized. Vaccination of infants born to hepatitis B surface antigen (HBsAg)-negative mothers can be delayed in rare circumstances, **but only if a physician's order to withhold the vaccine and a copy of the mother's original HBsAg-negative laboratory report are documented in the infant's medical record.** Administering four doses of HepB is permissible (e.g., when combination vaccines are administered after the birth dose); however, if monovalent HepB is used, a dose at age 4 months is not needed. For infants born to HBsAg-positive mothers, testing for HBsAg and antibody to HBsAg after completion of the vaccine series should be conducted at age 9-18 months (generally at the next well-child visit after completion of the vaccine series).

2) A new tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine recommended by ACIP for adolescents (Tdap adolescent preparation) was approved by the FDA on May 5, 2005, for use in the United States. **Tdap is recommended for adolescents aged 11-12 years** who have completed the recommended childhood diphtheria and tetanus toxoids and pertussis/diphtheria and tetanus toxoids and acellular pertusis (DTP/DTaP) vaccination series, and have not received a tetanus and diphtheria toxoids (Td) booster dose. Adolescents aged 13-18 years who missed the age 11-12 year Td/Tdap booster dose should also receive a *single dose* of Tdap if they have completed the recommended childhood DTP/DTaP vaccination series. Subsequent Td boosters are recommended every ten years.

3) Meningococcal conjugate vaccine (MCV4), approved by FDA on January 14, 2005, should be administered to all children at age 11-12 years as well as to unvaccinated adolescents at high school entry (age 15 years). Other adolescents who wish to decrease their risk for meningococcal disease may also be vaccinated. All college freshmen living in dormitories should also be vaccinated with MCV4 or meningococcal polysaccharide vaccine (MPSV4). For prevention of invasive meningococcal disease, vaccination with MPSV4 for children aged 2-10 years and with MCV4 for older children in certain high-risk groups is recommended.

6) Influenza vaccine is now recommended for children aged ≥6 months with certain risk factors, which now specifically include conditions that can **compromise respiratory function or handling of respiratory secretions,** or that can increase the risk for aspiration.

5) **Hepatitis A vaccine is now universally recommended for all children at age one year** (12-23 months). The two doses in the series should be administered at least 6 months apart.

6) The catch-up schedule for persons aged 7-18 years has been changed for Td; Tdap may be substituted for any dose in a primary catch-up series or as a booster if age appropriate for Tdap. A five year interval from the last Td dose is encouraged when Tdap is used as a booster dose.

To access the new schedule, visit: www.cdc.gov/mmwr/pdf/wk/mm5451-Immunization.pdf.
(Please note that the Washington State VFC program has not yet funded all the new ACIP recommendations.)

Available in alternate formats